



A-LEVEL MATHS QUESTIONS

Mechanics and Statistics - Day 3

COMPLETE ALL QUESTIONS

CHASING A STAR



1. Let $X \sim N(\mu, \sigma^2)$. Given that $P(X > 10) = 0.2$ and $P(X < 5) = 0.25$, find μ and σ .

2. A cannonball is fired from the edge of a 20m high cliff. It is fired at an angle of 20 degrees above the horizontal, with an initial speed of 100m/s
 - i Determine how long the cannonball is in flight for before it hits the sea.
 - ii Determine the horizontal distance between the points where it was fired and where it landed.

3. Two particles of masses 5kg and 10kg are fired towards each other, with speeds of 15m/s and 4m/s. Given that they coalesce, determine their velocity immediately after collision.

4. An ice hockey puck is gently hit so that it has an initial velocity of 3m/s. Given that it travels 15m across the ice rink before coming to rest, determine the coefficient of friction between the puck and the ice

5. A game is played in which a dice is rolled until two sixes appear on successive rolls. Determine the probability that the game ends after exactly four rolls.